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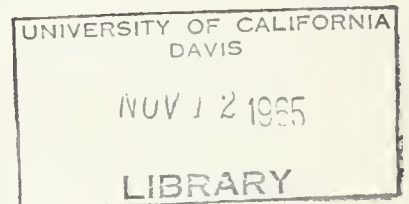


State of California
THE RESOURCES AGENCY
Department of Water Resources

BULLETIN No. 69-64

CALIFORNIA HIGH WATER
1963 - 1964

SEPTEMBER 1965



HUGO FISHER
Administrator
The Resources Agency

EDMUND G. BROWN
Governor
State of California

WILLIAM E. WARNE
Director
Department of Water Resources

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FOREWORD

This report, Bulletin 69-64, "California High Water 1963-1964", is the second of an annual series on the subject of high water in California.

This report was prepared to provide (in one report) information on precipitation, and peak flows and stages, resulting from the major storms of the water year. These reports contain a summary of the water year events, a description of the general weather characteristics preceding and during the storm period, a discussion of the precipitation characteristics, a discussion of the resulting runoff, and a review of the flood damage. When significant, tabulations of precipitation comparisons, peak flows and stages, and reservoir storage data are included in the appendixes.

Basic data for these reports are supplied by many governmental and private agencies. Among these are the United States Weather Bureau, United States Geological Survey, United States Bureau of Reclamation, Corps of Engineers, Pacific Gas and Electric Company, East Bay Municipal Utility District, and numerous other public and private districts and agencies.

The data appearing in this report are considered to be accurate and reliable. It should be noted, however, that hydrologic data may be revised (usually the changes are minor) at a later date on the basis of subsequent studies and information. Therefore, all data should be considered to be preliminary and subject to revision.

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PARTMENT OF WATER RESOURCES

BOX 388
AMENTO

June 22, 1965

Honorable Edmund G. Brown, Governor
and Members of the Legislature of
the State of California

Gentlemen:

Bulletin No. 69-64, "California High Water, 1963-1964", is the second of an annual series summarizing water year events. The report provides data on precipitation, streamflows, and flood damage resulting from the major storms of the 1963-64 water year, and is intended for the information of both governmental and private agencies, as well as the general public.

Sincerely yours,

A handwritten signature in cursive script, reading "William E. Warne", is positioned above the title "Director".

Director

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES

EDMUND G. BROWN, Governor
HUGO FISHER, Administrator, The Resources Agency
WILLIAM E. WARNE, Director, Department of Water Resources

ALFRED R. GOLZE' Chief Engineer

DIVISION OF OPERATIONS

ROBIN R. REYNOLDS Division Engineer

WILLIAM L. HORN Chief, Water Operations Branch

This report was prepared under the
immediate supervision of

ROBERT W. MILLER . . Chief, Flood Operations & Forecasts Unit

by

WILLIAM A. ARVOLA Meteorologist III

and

CHARLES H. HOWARD Associate Engineer, W.R.

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RICHARD A. McGUIRE Engineering Aid II

RICHARD SPELLMAN Student Trainee

CALIFORNIA HIGH WATER

1963 - 1964

Summary

The 1963-64 water year (October 1 - September 30) was essentially dry, with only one major period of precipitation intense enough to produce significant runoff.

At the beginning of the water year, the October - November period was marked by several storms in which most of the state received above-average rainfall. Some locations in southeastern California received 3 to 4 times normal amounts as a result of these storms. Resultant runoff amounts and streamflows were generally moderate in Northern and Central California, but Southern California reported scattered instances of minor flooding and some damage to property and crops.

In contrast, very little precipitation fell anywhere in the state during the month of December; so little, in fact, that despite the above-normal amounts of the previous months, the accumulated total at the end of December was below normal for most areas.

This trend was reversed during the month of January in the North Coast and central part of the state, and particularly in the Sierra Nevada, with precipitation well above normal at these locations. Elsewhere in California the unseasonably dry weather continued.

As the most significant high water events of the year were associated with the storm period of January 17-27, the meteorology, runoff, and damages associated with this storm are described in detail in this bulletin.

From February to May, the remainder of the usual high water season, unusually dry conditions prevailed in most of California, and resulting streamflows were held to below-normal values. The month of February was established as one of the driest on record, with less than one inch of precipitation at most stations in the state. By May 1, the water year was noted as one of the 10 driest that had occurred in the last 50 years.

Meteorology of the January 1964 Storm

December 1963 in California can be described as having been cold, foggy, and with very little rain. High pressure systems over the Great Basin plateau dominated the circulation pattern, and only a few storm fronts penetrated into California.

In January the Aleutian low pressure center began to deepen and spread out on a west-to-east axis. To the south, the central Pacific anticyclone, also much stronger than normal, extended across the Pacific. The strong pressure gradient (south-to-north) between the two systems stimulated a strong westerly flow through the United States. More weather fronts began to move through California, but the resulting precipitation was not unusually heavy in the first half of the month.

A cold front entered California in the North Coast area on the morning of January 17, and by the next morning had moved into the Los Angeles area. The rainfall from this system was of only moderate intensity. A new storm which developed in the central Pacific south of the Aleutians near the 50th parallel began to move toward the Washington-Oregon coast on the morning of January 18. The frontal system in this storm had the structure of an open wave cyclone with a very wide warm sector, and was located in the north of a fairly intense Pacific high pressure cell centered along the 35th parallel. The warm

front of this system reached the Northern California coast late on the 18th, preceded by an area of precipitation. The freezing level ahead of the warm front in the Central Sierra was about 3,500 feet, and although the passage of the warm front across the state was not clearly marked by observations at various stations, some warming occurred in the mountains with the freezing level lifting to 5,000 feet. Snow fell at elevations above this level. The warm front rains at lower elevations were heaviest in the North Coast area and in the Sierra Nevada, with only light amounts at low elevations in the San Francisco Bay area and the Sacramento Valley.

The cold front of this storm was delayed in entering California until the early morning hours of January 20, passing Eureka at 0100 hours, San Francisco at 1900 hours, and Sacramento at 2000 hours. This cold front was accompanied by heavy precipitation. In the hour ending at 1900 hours, San Francisco International Airport had a one-hour rainfall of 0.87 inch; the maximum six-hour amount was 2.06 inches. Sacramento (City Office, USWB) had two hours with 0.41 inch in each hour; the maximum six-hour amount was 1.97 inches. These precipitation rates represent fairly intense frontal precipitation. The cold front precipitation at low elevations had durations of 6 to 12 hours.

The snow depth at Blue Canyon (elevation 5,280 feet) on Interstate Highway 80 increased from 4 inches on the morning of January 17 to 57 inches on the morning of January 22, although

some of the precipitation which fell during the warmest part of the storm on the 19th fell as rain mixed with snow. The largest accumulation at Blue Canyon occurred during the period from the 20th to the 22nd.

Isohyetal maps for this storm, covering the 10-day period January 15-25, 1964, are shown on Plates 2 - 5. The amounts of maximum storm precipitation were 14 inches in the Smith, lower Klamath, Mattole, Eel, upper Sacramento (above Shasta Dam), Feather, Yuba, and American River Basins. Most of the precipitation in this 10-day period fell during the 5 days beginning on January 17.

Runoff

In general, low to moderate flows occurred in Northern and Central California streams during the period January 20-24, although in several locations new maximum flows of record were established. The following is a brief discussion of the runoff in each basin affected, including comparisons with peaks from the 1962-63 water year, as well as with maximum peaks of record.

North Coastal Area

Most of the northerly basins had moderate flows, slightly below those recorded in 1962. The Smith River near Crescent City had a peak of 93,400 cfs, as compared to 113,000 cfs in 1962, and a maximum recorded peak of 165,000 cfs in 1955. The Klamath River near Klamath had a peak flow of 162,000 cfs, as compared to 176,000 cfs in 1962, and a maximum recorded peak of 425,000 cfs in 1955.

Further south, the Mad River near Arcata recorded 45,200 cfs, compared to 28,900 cfs in 1962, and a maximum of record of 77,800 cfs in 1955. The Eel River at Scotia had a peak flow of 178,000 cfs, as compared to 252,000 cfs in 1963, and a maximum recorded flow of 541,000 cfs in 1955. Several smaller streams in this area had new peak flows of record, as follows: Willow Creek at Willow Creek, 5,260 cfs, as compared to a previous maximum of 5,190 cfs in 1962; Little River at

Crannell, 11,200 cfs, compared to 9,300 cfs in 1957; and the North Fork Mad River near Korbel, 8,400 cfs surpassing 7,170 cfs in 1960.

In the Russian River basin, flows were generally somewhat below those of the previous year. Dry Creek near Geyserville, a tributary of the Russian River, recorded 10,200 cfs, compared to a peak of record of 25,800 cfs established in 1963. The Russian River near Guerneville peaked at 33,400 cfs, compared to 71,800 cfs in 1963, and a maximum of record of 90,100 cfs in 1955.

San Francisco Bay Area

Streamflows in the San Francisco Bay area can be classified in the low to moderate range, with a few isolated high flows, in contrast to 1962-63, when many new peak flows of record were established.

In the North Bay area, the Napa River near Napa had a flow of 5,260 cfs, compared to a maximum of record of 16,900 cfs in 1963. Several creeks in this vicinity had peaks which equalled or exceeded previously established maximums. These were Walker Creek near Tomales with a flow of 3,430 cfs, equalling the record flows of 1961 and 1962, and Novato Creek near Novato with 1,330 cfs, exceeding the previous maximum of 1,190 cfs in 1958.

East Bay, South Bay, and Peninsula area streams had generally low flows, as typified by Walnut Creek at Walnut

Creek, with a peak of 2,760 cfs, compared to 11,400 cfs in 1962, and a maximum of record of 12,200 cfs in 1958.

Central Coastal Area

Low runoff occurred in most streams in this area, considerably below that of the previous year, and at several locations in the vicinity of Santa Maria no flow whatsoever was recorded.

The following are typical examples of the magnitude of flows in the Central Coast basins: the San Lorenzo River at Big Trees peaked at 2,660 cfs, in contrast to 13,000 cfs in 1963, and a maximum of record of 30,400 cfs in 1955. The Pajaro River at Chittenden had a flow of 1,460 cfs, compared to 11,400 cfs in 1963, and a maximum recorded peak of 24,000 cfs in 1955. Arroyo Seco near Soledad recorded 4,850 cfs, compared to 22,800 cfs in 1963, and a maximum of 28,300 cfs in 1958. The Nacimiento River near Bryson had 6,070 cfs, in contrast to 22,700 cfs in 1963, and a peak of record of 30,300 cfs established in 1955.

Central Valley Area

Runoff in the major basins and tributary streams of the Central Valley north of the Cosumnes River ranged from low to moderate; in most locations somewhat less than that of 1962-63. In the remainder of the valley, the San Joaquin River and its tributaries south from the Mokelumne River basin

recorded no increases over normal winter base flows. Plots of gage heights on the Sacramento River and Yolo Bypass are depicted on Plate 6, and those of the Feather, Yuba, and Bear Rivers and Cache Creek are shown on Plate 7.

In the north, Shasta Lake had moderate inflows from the Sacramento and McCloud Rivers and Squaw Creek, with very low inflow recorded from the Pit River. During the 10-day period January 18-28, storage in the reservoir increased approximately 245,000 acre-feet. Below Shasta, the peak discharge return to the Sacramento River at Keswick was 8,020 cfs. Downstream from Keswick, typical examples of flows in the upper valley tributaries are these: on the west side, Cottonwood Creek near Cottonwood had a flow of 13,000 cfs, compared to 23,100 cfs in 1963, and a maximum of 52,300 cfs in 1941; while Thomes Creek at Paskenta recorded 3,390 cfs, compared to 19,200 cfs in 1963, and a maximum of record of 23,500 cfs in 1955. On the east side of the valley, Cow Creek near Millville peaked at 17,900 cfs, compared to 24,800 cfs in 1962, and a maximum of record 45,200 cfs in 1951. Deer Creek near Vina had 7,880 cfs, in comparison to 10,200 cfs in 1962, and a maximum of record of 23,800 cfs in 1937.

In the Feather, Yuba, and American River basins, flows were very low, far below those of the previous year, when many new peak flows of record were established. In the Feather River basin, the Middle Fork Feather River near Merrimac had a flow of only 3,510 cfs, compared to a maximum

peak of 65,400 cfs in 1963. The Yuba River at Englebright Dam recorded 7,760 cfs, compared to a maximum of record of 150,000 cfs in 1963. On the American River, the Middle Fork near Auburn peaked at 3,410 cfs, in contrast to the record of 121,000 cfs in 1963.

Within the Sacramento River Flood Control Project, all flows were well below maximum project design quantities. The Sacramento River at Sacramento recorded a peak of 52,800 cfs, compared to a project design flow of 110,000 cfs at this location. Overflow occurred at Colusa and Tisdale Weirs, as shown on the following table:

TABLE I
Sacramento River Flood Control Project
WEIR OVERFLOWS

Weir	Beginning of Overflow		Length of Overflow Period	Peak Stage and Discharge	
	Date	Time			
Moulton				No Flow	
Colusa	1/21/64	2045	31 hours	63.81	9,810 cfs
Tisdale	1/22/64	0115	57 hours	47.59	6,390 cfs
Fremont				No Flow	
Sacramento				No gates opened	

South of Sacramento, runoff amounts generally tapered off and little or no increase over normal winter base flows were recorded in any of the major streams and tributaries of the San Joaquin Valley.

Flooded Areas and Flood Damage

Flood damage in January 1964 was considerably less than in previous high water years, with minor local flooding occurring in only a few locations.

In the North Coastal area, approximately one hundred residents of Orick were forced to evacuate homes and trailers as Redwood Creek overflowed its banks into low lying portions of the town. At the same time, the Smith River near Crescent City also experienced overbank flow, however neither location reported significant damages. South of Eureka, minor damage in the Eel River delta near Fernbridge and Loleta consisted of bank erosion and deposits of debris. Total damage in the entire area was estimated at \$300,000.

The San Francisco Bay and Russian River areas reported scattered instances of high water damage and inconvenience from flooding due to inadequate drainage facilities. Colma Creek in South San Francisco overbanked and inundated a portion of the Bayshore Freeway, interrupting peak hour commuter traffic. Extensive wind damage was also reported in the Bay area.

In the Central Valley, no serious flooding problems occurred, as precipitation from the storm fell as snow at very low elevations, holding river rises to a minimum. This unusually low snowfall, at some locations lower than 1,000 feet elevation, caused many power and telephone outages and road closures lasting several days or more. In the vicinity of

Sacramento, heavy rainfall caused temporary power failures, disruption of telephone service, and many flooded gutters and intersections as the capacity of drainage systems was exceeded. Near Wheatland, along the Camp Far West Canal south of the Bear River, a construction crew dynamited a levee which had impounded drainage water behind it and was causing flooding of nearby homes.

During the water year, several unusual and disastrous events involving water-caused damage also occurred, and although not directly associated with floods they are mentioned here as a matter of general interest.

The first of these events was the failure of the Baldwin Hills Reservoir, a 900 acre-foot capacity municipal reservoir owned and operated by the Los Angeles Department of Water and Power. On the afternoon of December 14, 1963, the main embankment of the reservoir ruptured, releasing a 10-foot deep wall of water which coursed down a one-half mile long canyon lined with homes and ultimately fanned out through a flat residential district. Five persons were killed, about two dozen homes were completely demolished, several hundred were made uninhabitable by heavy damage and silting, and some 2,000 more suffered lesser damages. The flooded area was about one-half square mile, and the total damage amounted to more than \$15,000,000. Subsequent investigation revealed that the cause of failure was gradual foundation subsidence culminating in a sudden earth movement on the day of the

disaster, allowing flow of water through and ultimate collapse of a portion of the embankment.

The second of these occurrences was in the form of a seismic sea wave (popularly misnamed "tidal wave") which struck the town of Crescent City shortly after midnight on March 28, 1964. This wave was a direct result of the disastrous earthquake which had devastated many communities in Alaska on the afternoon of Good Friday, some eight hours earlier. A wall of water 5 - 10 feet in height swept through the harbor of Crescent City and into a portion of the town, causing widespread damage to a 29 block area. Ten persons lost their lives, and total damage to public and private property amounted to approximately \$11,000,000.

Flood Control Projects Completed 1963-1964

In the Central Valley area, several projects which provide important flood control benefits were completed and placed in operation during the 1963-64 water year. These completed projects are covered below.

Black Butte Reservoir, located about 9 miles west of Orland on Stony Creek, provides flood protection to the towns of Orland and Hamilton City as well as protection to about 64,000 acres of farm land west of the Sacramento River. This reservoir, with a gross capacity of 160,000 acre-feet and a maximum flood control storage reservation of 150,000 acre-feet, is owned and operated by the U. S. Army Corps of Engineers.

Camanche Reservoir on the Mokelumne River, is located about 20 miles northeast of Stockton. It provides flood protection to about 69,000 acres of agricultural land; to 3,000 acres of urban and suburban land; and to the towns of Lodi, Woodbridge, and Thornton. The gross storage capacity of the reservoir is 431,500 acre-feet, with a maximum flood control storage reservation of 200,000 acre-feet. It is owned and operated by the East Bay Municipal Utility District.

New Hogan Reservoir is located on the Calaveras River about 28 miles northeast of Stockton, with the damsite immediately below that of the smaller Hogan Dam, which is now inundated. The project provides flood protection for about 46,000 acres of highly developed agricultural land along the

Calaveras River and about 14,000 acres of urban and suburban land in and adjacent to the City of Stockton. This reservoir is owned and operated by the U. S. Army Corps of Engineers, and has a gross storage capacity of 325,000 acre-feet with a maximum flood control storage reservation of 165,000 acre-feet.

Several units of the Department of Water Resources' Lower San Joaquin River Flood Control Project, which extends from the Merced River to Friant Dam, were also completed in 1963-64. Scheduled for completion in 1967, this project comprises many miles of levees and bypass systems designed to prevent flooding problems along the San Joaquin River and its tributaries in this area.

APPENDIX A

RUNOFF

TABLE A-1 PEAK FLOWS AND STAGES

APPENDIX A

TABLE A-1
PEAK FLOWS AND STAGES
(Preliminary Data, Subject to Revision)

Stream and Station	Drainage Area in Sq. Mi.	Period of Record	Source of Record (a)	Previous Maximum of Record			1963 - 1964			
				Date	Stage in ft.	Dischg. in cfs	Date	Time	Stage in ft.	Dischg. in cfs
North Coastal Area										
Middle Fork Smith River at Gasquet	130	1911-18 1958-	USGS	12/2/62	12.28	26,700	1/20	0200	10.52	18,200
Smith River near Crescent City	613	1931-	USGS	12/22/55	41.20	165,000	1/20	0200	31.22	93,400
Shasta River near Yreka	796	*1933-	USOS	12/22/55	9.43	6,090	1/20	1000	7.83	3,730
Scott River near Port Jones	662	1941-	USGS	12/22/55	21.40	38,500	1/20	1600	9.96	5,860
Klamath River nr. Seiad Valley	6,980	1912-25 1951-	USGS	12/22/55	29.2 ^h	122,000 ^c	1/20	1630	12.05	20,100 ^c
South Fork Salmon River near Forks of Salmon	252	1957-	USGS	12/22/55	18.86 ^h	24,200	1/20	0530	11.10	8,110
North Fork Salmon River near Forks of Salmon	205	1958-	USGS	12/2/62	14.27	10,500	1/20	0615	9.69	3,650
Salmon River at Somesbar	746	*1911-	USGS	12/22/55	28.80	84,000	1/20	0700	11.23	19,300
Klamath River at Somesbar	8,480	1927-	USGS	12/22/55	59.4 ^h	202,000 ^c	1/20	0900	26.30	57,900 ^c
Red Cap Creek near Orleans	56.1	1958-	USGS	12/2/62	10.69	5,340	1/20	0500	9.50	3,700
Bluff Creek near Weitchpec	74.6	1958-	USGS	12/22/55	13.7 ^h	20,200	1/20	0300	10.16	7,500
Trinity River above Coffee Creek near Trinity Center	149	1957-	USGS	2/24/58 12/22/55	10.50 10.5 ^h	12,800 12,800	1/20	0600	4.34	1,200
Trinity River at Lewiston	726	1911-	USGS	12/22/55	27.3	71,600	1/20	1200	4.99	570 ^c
North Fork Trinity River at Helena	151	1911-13 1957-	USGS DWR	1/12/59	19.66	13,500	1/20	0640	13.49	4,820
Trinity River nr. Burnt Ranch	1,438	1931-40 1956-	USGS	12/22/55	43.2 ^h	172,000	1/20	1700	13.46	15,800 ^c
New River at Denny	173	1927-28 1959-	USGS	12/2/62	11.71	9,580	1/20	0700	10.17	6,980
South Fork Trinity R. at Forest Glen	208	1959-	USGS	12/22/55	25.26 ^h	42,400	1/20	1130	15.68	11,400

TABLE A-1 (Continued)

Stream and Station	Drainage Area in Sq. Mi.	Period of Record	Source of Record (a)	Previous Maximum of Record			1963 - 1964			
				Date	Stage in ft.	Dischg. in cfs	Date	Time	Stage in ft.	Dischg. in cfs
North Coastal Area (Continued)										
South Fork Trinity River near Hyampom	342	1956-	USGS	12/22/55	22.2 ^{h,b}	39,400	1/20	1200	14.50	13,300
Hayfork Creek near Hayfork	87.2	1956-	USGS	2/8/60	11.67	4,210	1/20	0915	10.21	3,190
Hayfork Creek near Hyampom	379	1953-	USGS	12/22/55	18.00	25,300	1/20	1200	13.98	14,200
South Fork Trinity River near Salyer	899	1911-13 1950-	USGS	12/22/55	39.4 ^h	65,100	1/20	1500	26.00	27,800
Willow Creek at Willow Creek	43.3	1959-	USGS	12/2/62	10.02	5,190	1/20	0600	9.86	<u>5,260**</u>
Trinity River near Hoopa	2,848	*1911-	USGS	12/22/55	36.90	190,000	1/20	1800	21.68	62,300 ^c
Klamath River near Klamath	12,100	*1910-	USGS	12/22/55	49.7 ^h	425,000 ^c	1/20	2300	27.10	162,000 ^c
Redwood Creek at Orick	278	1911-13 1953-	USGS	1/18/53 12/22/55	23.95 ^h 23.95	50,000 50,000	1/20	0800	21.97	37,700
Little River at Crannell	44.3	1955-	USGS	3/11/57	9.96	9,300	1/20	0415	10.83	<u>11,200**</u>
Mad River near Forest Glenn	143	1953-	USGS	12/22/55	24.5 ^h	39,200	1/20	2000	9.93	7,300
North Fork Mad R. near Korbrel	40.5	1957-	USGS	2/8/60	16.17	7,170	1/20	0400	15.75	<u>8,400**</u>
Mad River near Arcata	484	1910-13 1950-	USGS	12/22/55	27.30 ^b	77,800	1/20	1000	16.04	45,200 ^c
Jacoby Creek nr. Freshwater	6.07	1954-	USGS	12/30/54	7.20	1,670	1/20	0245	5.03	900
Elk River near Falk	44.2	1957-	USGS	2/14/59	27.62	3,220	1/20	0715	27.13	3,050
Eel River below Scott Dam near Potter Valley	290	1922-	USGS	12/11/37	22.9 ^h	41,100 ^c	1/21	1800	8.20	2,600 ^c
Eel River at Van Arsdale Dam near Potter Valley	349	1909-	USGS	12/22/55	31.4 ^h	48,600	1/20	1600	11.70	4,710
Outlet Creek nr. Longvale	162	1956-	USGS	2/8/60	20.27	26,500	1/20	1200	14.31	13,600
Eel River above Doa Rios	705	1950-	USGS	12/22/55	45.4 ^h	123,000 ^c	1/20	1700	23.25	27,800 ^c
Black Butte River near Covelo	162	*1951-	USGS	12/21/55	35.8 ^{h,b}	25,000	1/20	1400	12.93	6,820

TABLE A-1 (Continued)

Stream and Station	Drainage Area in Sq. Mi.	Period of Record	Source of Record (a)	Previous Maximum of Record			1963 - 1964			
				Date	Stage in ft.	Dischg. in cfs	Date	Time	Stage in ft.	Dischg. in cfs
<u>North Coastal Area (Continued)</u>										
M. F. Eel River below Black Butte River, nr. Covelo	367	1951-	USGS	12/21/55	25.0 ^h	89,100	1/20	1300	13.53	20,500
Eel River below Dos Rios	1,484	1911-13 1951-	USGS	12/22/55	49.86	283,000 ^c	1/20	1800	26.13	76,900
North Fork Eel River near Mina	250	1953-	USGS	12/22/55	24.00	58,400	1/20	1200	19.50	27,800
Eel River at Alderpoint	2,079	1955-	USGS	12/22/55	72.5 ^h	376,000 ^c	1/20	2100	36.59	100,000 ^c
South Fork Eel R. nr. Branscomb	43.9	1946-	USGS	12/22/55	16.20	20,100	1/21	1300	10.00	6,860
Tenmile Creek nr. Laytonville	50.3	1957-	USGS	12/22/55	22.9 ^h	16,300	1/20	1100	13.86	6,760
South Fork Eel R. near Miranda	537	1939-	USGS	12/22/55	42.7 ^h	173,000	1/20	1700	24.00	59,000
Bull Creek nr. Weott	28.1	1960-	USGS	2/10/61 1/31/63	16.88 16.12	3,400 4,120	1/20	0300	14.33	1,930
Larabee Creek near Holmes	84.1	1959-	USGS	2/8/60	12.40	10,000	1/20	0600	11.33	7,890
Eel River at Scotia	3,113	*1910-	USGS	12/22/55	61.90	541,000	1/21	0200	39.40	178,000
South Fork Van Duzen River nr. Bridgeville	36.2	*1951-	USGS	12/22/55	11.91 ^{b, h}	8,990	1/20	0600	13.63	6,760
Van Duzen River nr. Bridgeville	216	1950-	USGS	12/22/55	21.3 ^h	43,500	1/20	0800	18.10	32,000
Mattole River nr. Petrolia	240	*1911-	USGS	12/22/55	29.60	90,400	1/20	0800	21.85	43,200
Noyo River nr. Fort Bragg	106	1951-	USGS	12/22/55	25.64	22,000	1/20	unknown	17.72	6,570
Rancheria Creek near Boonville	65.6	1959-	USGS	1/31/63	18.30	13,900	1/20	1500	12.65	6,920
Navarro River near Navarro	303	1950-	USGS	12/22/55	40.60	64,500	1/20	2100	25.80	17,900
South Fork Gualala River nr. Annapolis	161	1950-	USGS	12/22/55	24.57	55,000	1/20	1800	13.60	15,000
Rusaian River near Ukiah	99.6	*1911-	USGS	12/21/55	21.0	18,900	1/20	1500	13.28	8,850
East Fork Rusaian River nr. Calpella	93.0	1941-	USGS	12/21/55	15.06 ^b	13,300 ^c	1/20	1600	12.85	8,340 ^c

TABLE A-1 (Continued)

Stream and Station	Drainage Area in Sq. Mi.	Period of Record	Source of Record (a)	Previous Maximum of Record			1963 - 1964			
				Date	Stage in ft.	Dischg. in cfs	Date	Time	Stage in ft.	Dischg. in cfs
North Coastal Area (Continued)										
Russian River near Hopland	362	1939-	USGS	12/22/55	27.00	45,000 ^c	1/20	2000	17.72	17,000 ^c
Feliz Creek near Hopland	31.1	1958-	USGS	1/31/63 12/23/55	13.43 13.60 ^h	2,910 2,710	1/20	1500	13.60	2,710
Russian River nr. Cloverdale	502	1951-	USGS	12/22/55	30.9 ^h	53,000 ^c	1/20	2315	18.23	16,600 ^c
Big Sulphur Cr. near Cloverdale	82.3	1957-	USGS	12/22/55	22.2 ^h	20,000	1/20	1545	11.21	5,830
Russian River nr. Healdsburg	793	1939-	USGS	2/28/40	30.0	67,000	1/21	0500	14.11	22,100
Dry Creek near Cloverdale	87.8	1941-	USGS	1/31/63	17.91	17,700	1/20	1600	9.55	4,720
Dry Creek nr. Geyserville	162	1959-	USGS	1/31/63	16.50	25,800	1/20	1800	9.78	10,200
Santa Rosa Creek near Santa Rosa	12.5	1959-	USGS	2/8/60	13.35 ^h	3,200	1/20	1700	8.95	1,040
Russian River nr. Guerneville	1,340	*1939-	USGS	12/23/55	49.7 ^h	90,100 ^c	1/21	0900	29.88	33,400 ^c
Austin Creek near Cazadero	63.1	1959-	USGS	2/13/62	20.6 ^l	15,100	1/20	1600	12.45	6,150
San Francisco Bay Area										
Walker Creek nr. Tomales	37.1	1959-	USGS	1/31/61 2/13/62	18.18 17.72	3,430 3,430	1/20	2000	18.52	<u>3,430**</u>
Corte Madera Creek at Ross	18.1	1951-	USGS	12/22/55	17.45	3,620	1/20	1800	10.07	1,010
Novato Creek near Novato	17.5	1946-	USGS	2/24/58	8.24	1,190	1/20	1800	8.74	<u>1,330**</u>
Sonoma Creek at Boyea Hot Springs	62.2	1955-	USGS	12/22/55	17.10	8,880	1/20	1800	11.69	4,360
Napa River nr. St. Helena	81.1	*1929-	USGS	12/22/55	16.17	12,600	1/20	2000	9.52	5,220
Dry Creek near Napa	17.4	1951-	USGS	2/24/58	8.11	3,460	1/20	1800	5.57	1,140
Napa River near Napa	218	*1929-	USGS	1/31/63	27.59	16,900	1/20	2300	16.15	5,260
Redwood Creek near Napa	9.81	1958-	USGS	1/31/63	9.90	1,330	1/20	1700	9.22	1,190

TABLE A-1 (Continued)

Stream and Station	Drainage Area in Sq. Mi.	Period of Record	Source of Record (a)	Previous Maximum of Record			1963 - 1964			
				Date	Stage in ft.	Dischg. in cfs	Date	Time	Stage in ft.	Dischg. in cfs
San Francisco Bay Area (Continued)										
San Ramon Creek at San Ramon	5.89	1952-	USGS	10/13/62	16.98	1,600	1/20	2100	5.57	480
San Ramon Creek at Walnut Creek	50.8	1952-	USGS	1/31/63 12/23/55	14.40 14.55	7,980 6,890	1/20	2300	7.82	2,130
Walnut Creek at Walnut Creek	79.2	1952-	USGS	4/2/58	20.2	12,200	1/20	2200	6.95	2,760
San Lorenzo Creek at Hayward	37.5	*1939-	USGS	10/13/62 12/22/55	19.73 ^h 20.82 ^h	7,460 -	1/20	2200	8.58	768
Arroyo Mocho nr. Pleasanton	143	1962-	USGS	2/1/63	8.60	1,760	1/21	0100	3.07	200
Arroyo Valle nr. Livermore	147	*1912-	USGS	12/23/55	13.93 ^h	18,200	1/21	0600	3.74	288
Arroyo Valle at Pleasanton	171	1957-	USGS	4/3/58	25.36	11,300	1/23	1000	7.66	217
Alameda Creek near Niles	633	1891-	USGS	12/23/55	14.9	29,000 ^c	1/22	1800	5.89	1,850 ^c
Patterson Creek at Union City	-	1958-	USGS	2/1/63	20.4 ^h	10,500	1/22	2100	10.46	1,100
Alameda Creek at Union City	653	1958-	USGS	2/1/63	19.25 ^h	1,770	1/22	2130	11.11	187
Coyote Creek near Madrone	196	*1902-	USGS	3/7/11	-	25,000			No Peak ^c	
Upper Penitencia Creek at San Jose	21.5	1961-	USGS	3/28/63	3.53	295	1/21	1930	3.98	88
Alamitos Creek nr. New Almaden	31.9	1958-	USGS	4/2/58	9.67	4,300	1/20	2200	5.00	710
Los Gatos Cr. at Los Gatos	38.6	*1929-	USGS	2/27/40	14.71 ^b	7,110	1/20	1900	5.00	127
Guadalupe River at San Jose	146	1929-	USGS	4/2/58	16.55	9,150 ^c	1/20	2400	5.10	1,980 ^c
Saratoga Creek at Saratoga	9.22	1933-	USGS	12/22/55	6.40	2,730	1/20	2130	3.85	338
Matadero Creek at Palo Alto	7.24	1952-	USGS	12/22/55 12/23/55	9.60 9.88 ^k	854 -	1/20	2030	2.34	223
San Francisquito Creek at Stanford University	37.5	*1930-	USGS	12/22/55	13.60	5,560	1/20	2200	4.50	785
Redwood Creek at Redwood City	1.82	1959-	USGS	1/31/63	9.36	644	1/20	2200	4.14	114
Pescadero Creek near Pescadero	45.9	1951-	USGS	12/23/55	21.27	9,420	1/20	2300	9.06	1,170

TABLE A-1 (Continued)

Stream and Station	Drainage Area in Sq. Mi.	Period of Record	Source of Record (a)	Previous Maximum of Record			1963 - 1964			
				Date	Stage in ft.	Dischg. in cfs	Date	Time	Stage in ft.	Dischg. in cfs
<u>Central Coastal Area</u>										
San Lorenzo River at Big Trees	111	1936-	USGS	12/23/55	22.55	30,400	1/21	0100	7.29	2,660
Branciforte Creek at Santa Cruz	17.3	1940-43 1952-	USGS	12/22/55	22.04	8,100	1/20	2300	9.05	903
Soquel Creek at Soquel	40.2	1951-	USGS	12/23/55	22.33	15,800	1/20	2400	7.55	1,390
Llagas Creek nr. Morgan Hill	19.6	1951-	USGS	4/2/58	8.45	3,190 ^c	1/20	2200	1.37	21 ^c
Bodfish Creek near Gilroy	7.40	1959-	USGS	1/31/63	8.25	1,240	1/22	0100	4.87	236
Tres Pinos Creek near Tres Pinos	206	1939-	USGS	4/4/41	7.75	8,060	1/23	1100	4.53	43
San Benito River near Hollister	586	1949-	USGS	4/3/58	16.30	11,600	1/24	0100-0400	3.11	44 ^c
Pajaro River at Chittenden	1,186	1939-	USGS	12/24/55 4/3/58	32.46 33.11	24,000 -	1/22	0900	9.24	1,460
Corralitos Creek near Corralitos	10.6	1957-	USGS	4/2/58 1/31/63	7.55 7.62	1,970 1,920	1/20	2200	3.74	299
Corralitos Creek at Freedom	27.8	1956-	USGS	12/22/55	15.6 ^h	3,620	1/20	2400	5.54	702
Salinas River near Pozo	74.1	1942-	USGS	1/21/43	13.35	7,210	1/21	0130	3.32	8.2
Salinas River above Pilitas Creek nr. Santa Margarita	114	1942-	USGS	4/3/58	8.68	4,720 ^c	1/22	0200	1.12	6.5 ^c
Jack Creek nr. Templeton	25.3	1949-	USGS	1/25/56	9.56	5,040	1/21	0100	4.34	352
Salinas River at Paso Robles	389	1939-	USGS	3/9/43	16.2	14,200 ^c	1/22	1130	8.12	237 ^c
Estrella River near Estrella	922	1954-	USGS	4/6/58	7.20	8,850	1/23	1700	2.09	12
Nacimiento River near Bryson	140	1955-	USGS	12/23/55	24.63	30,300	1/21	0030	11.71	6,070
San Antonio River at Pleyto	284	*1922-	USGS	4/3/58	6.44	19,100	1/22	1330	2.70	624
Salinas River near Bradley	2,535	1948-	USGS	4/3/58	12.53	28,400 ^c	1/23	0600	4.48	595 ^c
Arroyo Seco near Soledad	244	1901-	USGS	4/3/58	14.40 ^b	28,300	1/21	0330	10.34	4,850

TABLE A-1 (Continued)

Stream and Station	Drainage Area in Sq. Mi.	Period of Record	Source of Record (a)	Previous Maximum of Record			1963 - 1964			
				Date	Stage in ft.	Dischg. in cfs	Date	Time	Stage in ft.	Dischg. in cfs
<u>Central Coastal Area (Continued)</u>										
Salinas River near Spreckels	4,156	*1900-	USGS	2/12/38 1/16/52	25.0 26.85	75,000 ^d -	1/23	0900	10.25	609 ^c
Big Sur River near Big Sur	46.5	1950-	USGS	4/2/58	11.56	5,680	1/20	2300	6.48	1,470
Arroyo De La Cruz near San Simeon	41.4	1950-	USGS	12/23/55	12.40	17,700	1/21	0030	6.72	2,700
Santa Rosa Creek near Cambria	12.5	1957-	USGS	2/1/60 12/9/55	10.36 15.2 ^h	2,520 -	1/20	2400	4.27	246
Arroyo Grande at Arroyo Grande	102	1939-	USGS	1/15/52	11.97	5,370	1/21	0100	1.46	9.1
Sisquoc River near Garey	472	1940-	USGS	1/23/43	8.46 ^b	13,000			No Flow During Year ^c	
Santa Maria River at Guadalupe	1,742	1940-	USGS	1/16/52	8.18	32,800			No Flow During Year ^c	
Santa Ynez River below Gibraltar Dam, nr. Santa Barbara	216	1920-	USGS	3/2/38	-	35,500 ^c	1/22	0130	4.61	3.2 ^c
Santa Cruz Creek near Santa Ynez	73.9	1941-	USGS	4/3/58	10.27	3,580	1/22	1300	3.50	22
San Jose Creek near Goleta	5.51	1941-	USGS	1/21/43 4/4/41	12.74 -	- 1,960	1/21	0330	2.96	84
Atascadero Creek near Goleta	18.3	1941-	USGS	1/15/52	10.85	4,500	1/21	0200	6.98	148
Carpinteria Creek near Carpinteria	13.1	1941-	USGS	1/15/52	9.75	2,440	1/22	0900	3.50	10
<u>Central Valley Area</u>										
Sacramento River at Delta	427	1944-	USGS USBR	12/22/55	19.50	37,000	1/20	1300	12.00	13,100
N. F. Pit River near Alturas	209	1929-32 1957-	USGS	10/14/62	11.07	2,530	1/21	0700	2.15	142
Pit River nr. Bieber	2,970	*1904-	USGS	3/19/07	16.7	33,800	1/21	1600	4.84	915
Pit River below Pit No. 4 Dam	4,860	1922-	USGS	12/12/37	17.90	30,200	1/20	1800	4.62	128
Pit River near Montgomery Creek	5,170	1944-	USGS	12/23/55	14.12	37,100			Backwater	
Squaw Creek above Shasta Lake	65.3	1944-	USGS USBR	12/21/55	21.90	17,800	1/20	1400	17.50	8,750

TABLE A-1 (Continued)

Stream and Station	Drainage Area in Sq. Mi.	Period of Record	Source of Record (a)	Previous Maximum of Record			1963 - 1964			
				Date	Stage in ft.	Dischg. in cfs	Date	Time	Stage in ft.	Dischg. in cfs
Central Valley Area (Continued)										
McCloud River above Shasta Lake	606	1945-	USGS USBR	12/22/55	28.20	45,200	1/20	1500	19.53	13,090
Sacramento River at Keswick	6,710	1938-	USGS DWR	2/23/40	47.2 ^b	186,000	1/20	1230	11.80	8,020
Clear Creek at French Gulch	115	1950-	USGS	12/22/55	13.49	7,050	1/20	1300	9.81	3,300
Clear Creek near Igo	228	1940-	USGS	12/21/55	13.75	24,500	1/20	1230	6.28	3,030
Cow Creek near Millville	425	1949-	USGS	12/27/51	21.55	45,200	1/20	2000	14.25	17,900
Cottonwood Creek near Cottonwood	922	1940-	USGS	3/1/41	15.4	52,300	1/20	2000	13.25	13,000
Battle Creek below Coleman Fish Hatchery near Cottonwood	358	1961-	USGS	12/11/37	15.8 ^{h, b}	35,000	1/20	1830	10.99	7,270
Paynes Creek nr. Red Bluff	92.7	1949-	USGS	12/1/61	11.33	10,600	1/20	2030	8.40	4,430
Sacramento River near Red Bluff	9,300	1892-	USGS	2/28/40	38.9	291,000	1/21	0200	14.80	61,600 ^c
Sacramento River at Red Bluff	-	-	DWR	2/28/40	32.2	-	1/21	0200	18.27	61,500 ^c
Red Bank Creek near Red Bluff	93.5	1959-	DWR USBR	1/31/63	8.67	5,770	1/20	1640	6.82	1,420
Antelope Creek near Red Bluff	123	1940-	USGS USCE	2/22/56	12.43	11,500	1/20	1830	12.09	7,280
Elder Creek near Paskenta	95.8	1948-	USGS	2/24/58	13.90	11,700	1/20	1600	8.11	2,280
Elder Creek at Gerber	136	1949-	USGS USBR	2/19/58	14.40 ^b	11,000	1/20	1930	8.53	2,600
Mill Creek near Los Molinos	131	*1909-	USGS	12/11/37	23.4 ^h	23,000	1/20	1900	9.82	7,000
Thomes Creek at Paskenta	194	1920-	USGS DWR	12/21/55	13.89	23,500	1/20	1530	7.79	3,390
Deer Creek near Vina	208	*1911-	USGS DWR	12/10/37	19.2 ^h	23,800	1/20	1800	10.30	7,880
Sacramento River at Vina Bridge	-	1945-	DWR USBR	2/25/58	89.42	147,000	1/21	0730	80.22	68,100

TABLE A-1 (Continued)

Stream and Station	Drainage Area in Sq. Mi.	Period of Record	Source of Record (a)	Previous Maximum of Record			1963 - 1964			
				Date	Stage in ft.	Dischg. in cfs	Date	Time	Stage in ft.	Dischg. in cfs
Central Valley Area (Continued)										
Sacramento River at Hamilton City	-	1945-	DWR USBR	12/11/37	150.7	350,000	1/21	1300	39.28	61,600 ^c
Big Chico Creek near Chico	72.5	1930-	USGS	12/10/37	16.6 ^b	8,260	1/20	2000	10.12	3,780
Stony Creek near Fruto	599	1901-1912 1960-	USGS	2/2/09	16.3 ^b	36,000	1/20	1900	6.47	3,400
Stony Creek near Hamilton City	777	*1940-	USGS	2/25/58	18.31	39,900 ^c			No Flow ^c	
Sacramento River at Ord Ferry	-	*1921-	DWR	2/28/40	121.7	370,000	1/21	1600-1800	109.0	57,500 ^c
Sacramento River at Butte City	-	*1921-	USGS DWR	2/7/42	96.87	170,000 ^c	1/21	2300	84.80	52,400
Moulton Weir Spill to Butte Basin	-	*1935-	DWR	2/20/58 2/26/58	83.66 83.66	36,000 ^d 36,000 ^d			No Flow	
Colusa Weir Spill to Butte Basin	-	*1935-	DWR	2/8/42	70.40	86,000 ^d	1/22	0840	63.81	9,810
Sacramento River at Colusa	-	1940-	USGS DWR	2/8/42	69.20	49,000 ^c	1/22	1000	61.88	33,300 ^c
Colusa Basin Drain at Highway 20	-	1924-	DWR	2/21/58	51.93	25,400 ^e	1/22	1200	43.35	339
Butte Creek near Chico	147	1930-	USGS	12/22/55	13.35	18,700 ^c	1/20	2000	7.20	4,940 ^c
Butte Slough to Sutter Bypass at Mawson Bridge	-	*1934-	DWR	3/1/40	68.9	210,000	1/24	1430	50.72	-
Sutter Bypass at Long Bridge	-	1914-	DWR	3/1/40	57.7	210,000	1/24	2000	43.86	-
Tisdale Weir Spill to Sutter Bypass	-	1940-	DWR	3/1/40	53.35	25,700 ^d	1/22	1830	47.59	6,390
Sacramento River at Knights Landing	-	1940-	USGS DWR	12/8/42 12/3/60	41.83 ^k 30.31	- 30,000 ^c	1/23	1300	35.24	22,200
Big Grizzly Creek near Portola	45.5	*1925-	USGS	2/1/63	8.03	4,080	1/20	2000	2.13	3 ^e Affected by ice
Middle Fork Feather River near Clito	686	1925-	USGS	2/1/63	16.19	14,500	1/20	2000	5.30	384
Middle Fork Feather River near Merrimac	1,068	1951-	USGS	2/1/63	21.65	65,400	1/20	2200	7.14	3,510

TABLE A-1 (Continued)

Stream and Station	Drainage Area in Sq. Mi.	Period of Record	Source of Record (a)	Previous Maximum of Record			1963 - 1964			
				Date	Stage in ft.	Dischg. in cfs	Date	Time	Stage in ft.	Dischg. in cfs
Central Valley Area (Continued)										
South Fork Feather River at Enterprise	132	1911-	USGS	12/22/55	21.60	19,200	1/20	2100	7.55	1,420
Feather River at Bidwell Bar	1,347	*1911-	USGS	12/23/55	25.5	104,000	1/20	2145	10.15	8,530
North Fork Feather River near Prattville	493	*1905-	USGS	3/19/07	16.2 ^b	10,000	1/20	-	1.86	12 ^c
Indian Creek near Crescent Mills	739	*1906-	USGS	12/24/55	17.80	31,500 ^c	1/20	2300	5.24	1,050 ^c
Spanish Creek above Blackhawk Creek, at Keddle	184	1933-	USGS	2/1/63	13.37	15,000 ^c	1/20	-	5.83	2,190 ^{h,c}
North Fork Feather River at Pulga (formerly Big Bar)	1,953	*1910-	USGS	12/23/55	35.60	72,400 ^{c,g}	1/20	1900	12.69	5,970
West Branch Feather River near Paradise	113	1957-	USGS	1/31/63	23.35	21,200 ^c	1/20	1830	11.65	4,850
Feather River at Oroville	3,632	1901-	USGS DWR	3/19/07	39.3 ^b	230,000	1/20	2300	144.40	31,200 ^c
Feather River near Gridley	-	*1929-	DWR	12/23/55	102.25	-	1/21	0340	85.18	23,500
South Honcut Creek near Bangor	30.5	1950-	USGS	10/13/62	12.40	8,280	1/20	1945	8.62	2,960
Feather River at Yuba City	-	1944-	DWR	12/24/55	82.42	-	1/22	0310	53.23	21,500
Middle Yuba River above Oregon Creek	162	1940-	USGS	1/31/63	18.55	31,600 ^c	1/20	2200	6.09	1,680 ^c
Oregon Creek near North San Juan	34.4	1911-	USGS	12/22/55	11.90	5,390	1/20	2100	5.97	800
North Yuba River below Goodyears Bar	250	*1930-	USGS	2/1/63	23.8	40,000	1/20	2200	6.06	1,720
North Yuba River below Bullards Bar Dam	487	1940-	USGS	1/31/63	42.0 ^h	83,000 ^c	1/21	0700	8.90	2,060 ^c
South Yuba River nr. Cisco	51.8	1942-	USGS	1/31/63	20.6 ^h	18,400 ^c	1/22	1230	2.55	48 ^c
South Yuba River at Jones Bar	310	1940-48 1959-	USGS	1/31/63	21.5 ^h	40,000	1/21	0100	9.02	2,500

TABLE A-1 (Continued)

Stream and Station	Drainage Area in Sq. Mi.	Period of Record	Source of Record (a)	Previous Maximum of Record			1963 - 1964			
				Date	Stage in ft.	Dischg. in cfs	Date	Time	Stage in ft.	Dischg. in cfs
<u>Central Valley Area</u> (Continued)										
Yuba River at Englebright Dam	1,104	1941-	USGS PGE	2/1/63	544.84	150,000 ^{c,f}	1/20	2300	529.98	7,760 ^c
Deer Creek near Smartville	84.6	1935-	USGS	10/13/62	13.77	11,600 ^c	1/20	2100	10.36	6,170 ^c
Yuba River near Marysville	1,340	*1940-	USGS	12/23/55	88.85	160,000 ^c	1/21	0100	68.07	16,300 ^c
Bear River near Auburn	139	1940-	USGS	12/22/55	16.56 ^b	19,700	1/21	0200	9.58	3,900
Bear River nr. Wheatland	292	1928-	USGS	12/22/55	19.30	33,000 ^c	1/21	2100	2.86	1,260 ^c
Feather River at Nicolaus	5,928	1943-	USGS DWR	12/23/55	51.60	357,000 ^c	1/22	1200	37.78	34,000 ^c
Sacramento River at Fremont Weir (West End)	-	*1935-	DWR	12/23/55	39.72	293,800 ^d	1/23	1610	33.47	No Flow Over Weir
Sacramento River at Verona	-	1929-	USGS DWR	3/1/40	41.20	79,200 ^c	1/23	1000	31.36	50,500
Sacramento Weir Spill to Yolo Bypass, near Sacramento	-	*1939-	USGS DWR	3/26/28 12/23/55	31.83 33.01	118,000 ^d -			No Flow	
North Fork American River at North Fork Dam	343	1941-	USGS	1/31/63	11.30	59,700 ^c	1/21	0230	3.29	3,740 ^c
Rubicon River near Foresthill	311	1958-	USGS	2/1/63	35.0 ^h	83,000 ^c	1/21	0600	10.60	990 ^c
Middle Fork American River near Auburn	612	1911-	USGS	2/1/63	43.1 ^h	121,000	1/21	0500	9.27	3,410
South Fork American River near Kyburz	193	1907, 1922-	USGS	2/1/63	10.53	15,600 ^{c,g}	1/20	2330	2.12	66 ^c
South Fork American River near Camino	493	1922-	USGS PGE	12/23/55	32.6 ^h	49,800 ^c	1/21	0330	6.42	1,590 ^c
South Fork American River near Lotus	673	1951-	USGS	12/23/55	21.37	71,800 ^c	1/20	2230	8.31	4,000 ^c
American River at Fair Oaks	1,889	1904-	USGS	11/21/50	31.85 ^b	180,000	1/21	2300	2.93	3,000

TABLE A-1 (Continued)

Stream and Station	Drainage Area in Sq. Mi.	Period of Record	Source of Record (a)	Previous Maximum of Record			1963 - 1964			
				Date	Stage in ft.	Dischg. in cfs	Date	Time	Stage in ft.	Dischg. in cfs
Central Valley Area (Continued)										
Sacramento River at Sacramento	-	*1879-	USGS DWR	11/21/50	30.14 ^b	104,000 ^c	1/23	1630	17.31	52,800 ^c
Sacramento River at Walnut Grove	-	1929-	DWR	11/21/50	13.0	-	1/23	1210	7.18	-
Adobe Creek nr. Kelseyville	6.39	1954-	USGS	1/31/63	9.22	1,450	1/20	1400	7.50	800
Kelsey Creek nr. Kelseyville	37.2	1946-	USGS	12/21/55	12.80	8,800	1/20	1600	10.95	5,310
Cache Creek near Lower Lake	528	1944-	USGS	2/24/58	9.40	8,000 ^c	Regulated - Low Flow			
North Fork Cache Creek near Lower Lake	198	1930-	USGS	12/11/37	13.98 ^h	20,300	1/20	1900	8.55	6,020
Cache Creek near Capay	1,052	1942-	USGS	2/24/58	20.90	51,600 ^c	1/21	0430	10.13	7,710 ^c
Cache Creek at Yolo	1,137	1903-	USGS	2/25/58	33.11	41,400 ^{c, g}	1/21	1000	13.17	7,340 ^{c, g}
Yolo Bypass near Woodland	-	1939-	USGS DWR	2/8/42	32.00	272,000	No Flow			
Dry Creek near Middletown	8.41	1959-	USGS	2/8/60	9.90	3,470	1/20	1800	7.52	1,160
Putah Creek near Winters	577	1930-	USGS DWR	2/27/40	30.5	81,000	1/20	2000	6.18	252 ^c
Yolo Bypass near Lisbon	-	1914-	DWR	12/24/55	23.4 ^b	304,800	1/24	1700	9.69	Flow Confined to Low Water Channel
Sacramento River near Rio Vista	-	1906-	USCE DWR	12/25/55	10.2	-	Tidal			
North Fork Cosumnes River near El Dorado	205	1911-41 1948-	USGS	12/23/55	14.8	15,800 ^c	1/22	0430	4.77	598 ^c
Middle Fork Cosumnes River near Somerset	107	1957-	USGS	2/1/63	16.20	11,800	1/21	0130	5.80	309
South Fork Cosumnes River near River Pines	64.3	1957-	USGS	2/1/63	10.90	5,540	1/21	0130	3.38	565

TABLE A-1 (Continued)

Stream and Station	Drainage Area in Sq. Mi.	Period of Record	Source of Record (a)	Previous Maximum of Record			1963 - 1964			
				Date	Stage in ft.	Dischg. in cfs	Date	Time	Stage in ft.	Dischg. in cfs
<u>Central Valley Area (Continued)</u>										
Cosumnes River at Michigan Bar	537	1907-	USGS DWR	12/23/55	14.59	42,000 ^c	1/22	0700	6.29	4,010 ^c
Cosumnes River at McConnell	724	1941-	USGS USBR DWR	12/23/55	46.26	54,000 ^c	1/22	1400	39.28	5,470 ^c
Dry Creek near Galt	329	1926-1933 1944-	USGS USBR DWR	4/3/58	15.28	24,000	1/21	0100	11.30	1,630

LEGEND

- (a) USCE - United States Corps of Engineers
 USGS - United States Geological Survey
 USBR - United States Bureau of Reclamation
 DWR - Department of Water Resources
 PGE - Pacific Gas and Electric Company
 b - Site and datum then in use
 c - Affected by storage and/or diversion
 d - Discharge over weir
 e - Estimated
 f - Includes flow through powerhouse
 g - Includes flow bypassing station
 h - From flood marks
 k - Discharge not determined; affected by backwater
 l - Crest stage gage
 * - Incomplete Record
 ** - Maximum of Record

PLATES

STATE OF CALIFORNIA
THE RESOURCES AGENCY
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DIVISION OF OPERATIONS

HIGH WATER OF 1963-64

MAJOR DRAINAGE AREAS IN CALIFORNIA

LEGEND

ELEVATION IN FEET

500 AND UNDER

500 TO 2500

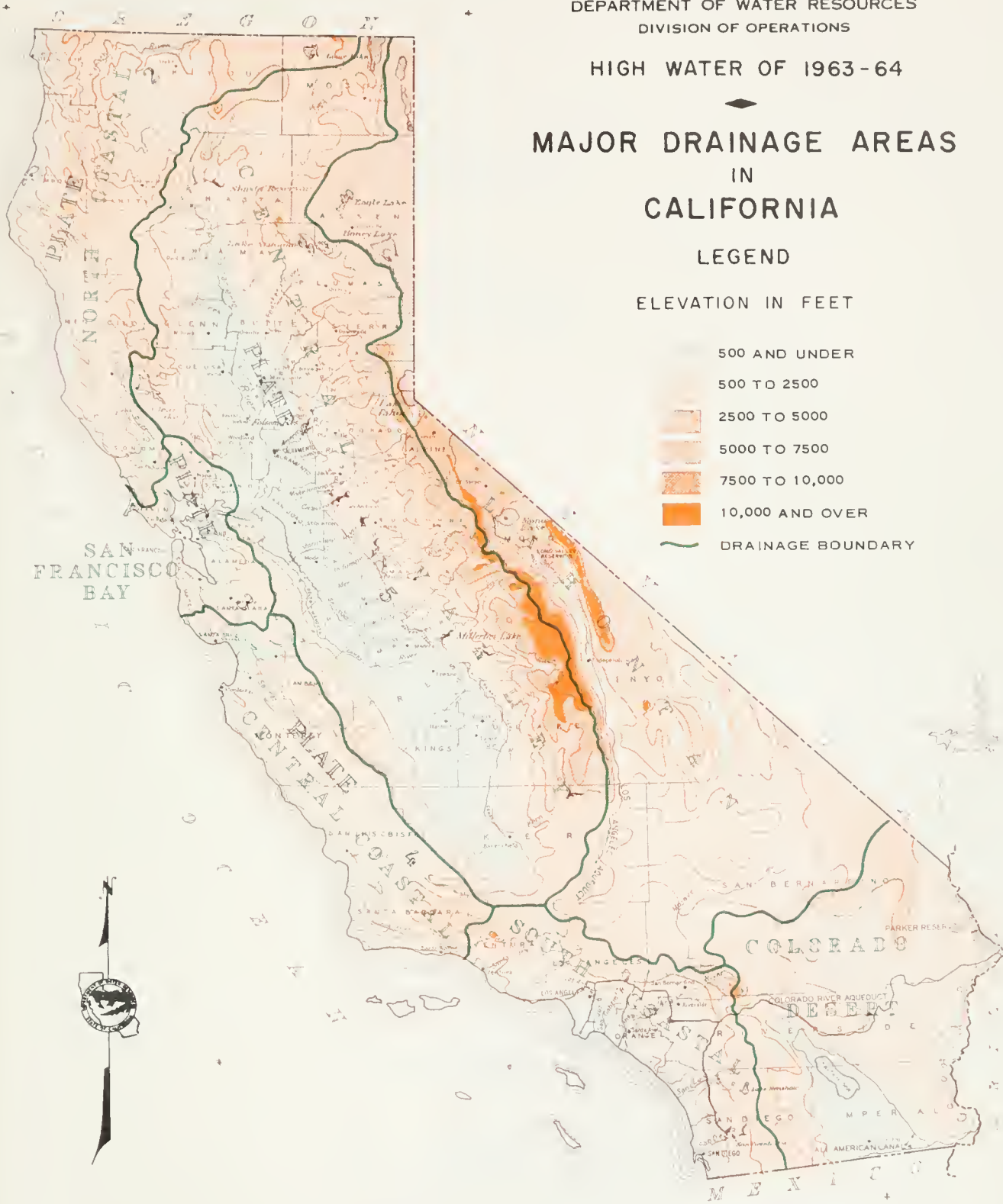
2500 TO 5000

5000 TO 7500

7500 TO 10,000

10,000 AND OVER

DRAINAGE BOUNDARY



END

AGING STATION

PRECIPITATION STATION

LAKE

BASIN BOUNDARY

OF RAINFALL IN INCHES

PERIOD JAN. 15-25, 1964



SAN FRANCISCO
BAY AREA

+38°
123°

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
DIVISION OF OPERATIONS

HIGH WATER OF 1963 - 64
JANUARY 1964 STORM

NORTH COASTAL AREA
AL AND STATION LOCATION MAP

**NORTH COASTAL AREA
STREAM GAGING STATIONS**

- 1 Middle Fork Smith River at Gasquet
- 2 South River near Crescent City
- 3 Shasta River near Yreka
- 4 Scott River near Fort Jones
- 5 Klamath River near Seiad Valley
- 6 South Fork Salmon River near Forks of Salmon
- 7 North Fork Salmon River near Forks of Salmon
- 8 Salmon River at Sossabear
- 9 Klamath River at Sossabear
- 10 Red Cap Creek near Orleans
- 11 Bluff Creek near Hetchpec
- 12 Trinity River above Coffee Creek near Trinity Center
- 13 Trinity River at Lewiston
- 14 North Fork Trinity River at Helena
- 15 Trinity River near Burnt Ranch
- 16 New River at Dennv
- 17 South Fork Trinity River at Forest Glenn
- 18 South Fork Trinity River near Hyampom
- 19 Hayfork Creek near Hayfork
- 20 Hayfork Creek near Hyampom
- 21 South Fork Trinity River near Salyer
- 22 Willow Creek at Willow Creek
- 23 Trinity River near Hoopa
- 24 Klamath River near Klamath
- 25 Redwood Creek at Orick
- 26 Little River at Cassell
- 27 Mad River near Forest Glena
- 28 North Fork Mad River near Norbel
- 29 Mad River near Arcata
- 30 Tenby Creek near Freshwater
- 31 Elk River near Falls
- 32 Eel River below Scott Dam near Potter Valley
- 33 Eel River at Van Arsdale Dam near Potter Valley
- 34 Outlet Creek near Longvale
- 35 Eel River above Dos Rios
- 36 Black Butte River near Covelo
- 37 Middle Fork Eel River below Black Butte River near Covelo
- 38 Eel River below Dos Rios
- 39 North Fork Eel River near Nina
- 40 Eel River at Alderpoint
- 41 South Fork Eel River near Branscomb
- 42 Tenmile Creek near Laytonville
- 43 South Fork Eel River near Miranda
- 44 Bull Creek near Woot
- 45 Larkbee Creek near Holmes
- 46 Eel River at Scotia

**NORTH COASTAL AREA
STREAM GAGING STATIONS
(CONTINUED)**

- 47 South Fork Van Duzen River near Bridgeville
- 48 Van Duzen River near Bridgeville
- 49 Mattole River near Petrolia
- 50 Noyo River near Fort Bragg
- 51 Rancheros Creek near Boonville
- 52 Navarro River near Navarro
- 53 South Fork Gualala River near Annapolis
- 54 Russian River near Ukiah
- 55 East Fork Russian River near Calpella
- 56 Russian River near Hopland
- 57 Feliz Creek near Hopland
- 58 Russian River near Cloverdale
- 59 Big Sulphur Creek near Cloverdale
- 60 Russian River near Healdsburg
- 61 Dry Creek near Cloverdale
- 62 Dry Creek near Geyserville
- 63 Santa Rosa Creek near Santa Rosa
- 64 Russian River near Guerneville
- 65 Austin Creek near Cazadero

**NORTH COASTAL AREA
HOURLY PRECIPITATION STATIONS**

- 1 Crescent City Maintenance Station
- 2 Happy Camp Ranger Station
- 3 Klamath
- 4 Etna
- 5 Hoopa
- 6 Coffee Creek Ranger Station
- 7 Eureka NB City
- 8 Kneeland 10 SSE
- 9 Hyampom
- 10 Miranda Spengler Ranch
- 11 Lake Mountain
- 12 Covelo Eel River Ranger Station
- 13 Laytonville
- 14 Fort Bragg
- 15 Willits Howard Forest Ranger Station
- 16 Redwood Valley
- 17 Navarro 1 NW
- 18 Point Arena
- 19 The Geysers
- 20 Venado

LEGEND

- STREAM GAGING STATION
- HOURLY PRECIPITATION STATION
- RESERVOIR
- NATURAL LAKE
- DRAINAGE BASIN BOUNDARY
- ISOHYETS OF RAINFALL IN INCHES

FOR THE PERIOD JAN 15-25, 1964



**NORTH COASTAL AREA
ISOHYETAL AND STATION LOCATION MAP**

**SAN FRANCISCO BAY AREA
STREAM GAGING STATIONS**

- 1 Walker Creek near Tomales
- 2 Corte Madera Creek at Ross
- 3 Novato Creek near Novato
- 4 Sonoma Creek at Boyes Hot Springs
- 5 Napa River near St. Helena
- 6 Dry Creek near Napa
- 7 Napa River near Napa
- 8 Redwood Creek near Napa
- 9 San Ramon Creek at San Ramon
- 10 San Ramon Creek at Walnut Creek
- 11 Walnut Creek at Walnut Creek
- 12 San Lorenzo Creek at Hayward
- 13 Arroyo Mocho near Pleasanton
- 14 Arroyo Valle near Livermore
- 15 Arroyo Valle at Pleasanton
- 16 Alameda Creek near Niles
- 17 Patterson Creek at Union City
- 18 Alameda Creek at Union City
- 19 Coyote Creek near Modrone
- 20 Upper Penitencia Creek at San Jose
- 21 Alamitos Creek near New Almaden
- 22 Los Gatos Creek at Los Gatos
- 23 Guadalupe River at San Jose
- 24 Saratoga Creek at Saratoga
- 25 Matadero Creek at Palo Alto
- 26 San Francisco Creek at Stanford University
- 27 Redwood Creek at Redwood City
- 28 Pescadero Creek near Pescadero

**SAN FRANCISCO BAY AREA
HOURLY PRECIPITATION STATIONS**

- 1 St. Helena 4 WSW
- 2 Petaluma 1 N
- 3 Novato 8 WNW
- 4 Mount Tamalpais 2 SW
- 5 Martinez 3 S
- 6 Walnut Creek 2 ENE
- 7 Oakland WB AP
- 8 San Francisco FOB
- 9 San Francisco WB AP
- 10 SE Farallon
- 11 Hayward 6 ESE
- 12 Palo Alto City Hall
- 13 San Jose
- 14 Morgan Hill 6 WNW



LEGEND

- ▲ STREAM GAGING STATION
- HOURLY PRECIPITATION STATION
- RESERVOIR
- NATURAL LAKE
- DRAINAGE BASIN BOUNDARY
- ISOHYETS OF RAINFALL IN INCHES FOR THE PERIOD JAN 15-25, 1964

STATE OF CALIFORNIA
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HIGH WATER OF 1963-64
JANUARY 1964 STORM

**SAN FRANCISCO BAY AREA
ISOHYETAL AND STATION LOCATION MAP**

CENTRAL COASTAL AREA
STREAM GAGING STATIONS

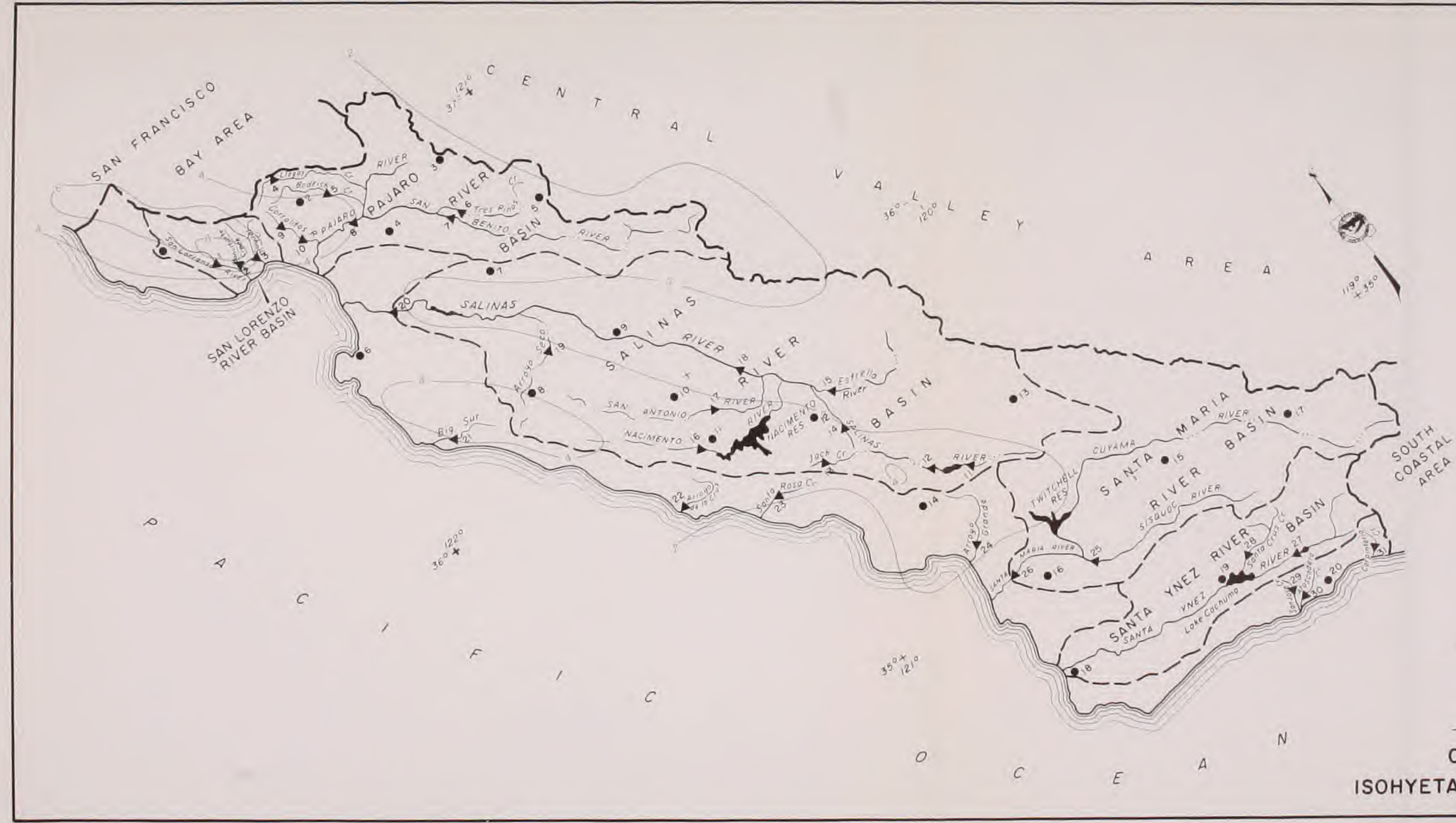
CENTRAL COASTAL AREA
STREAM GAGING STATIONS
(CONTINUED)

CENTRAL COASTAL AREA
HOURLY PRECIPITATION STATIONS

1. San Lorenzo River at Big Trees
2. Branciforte Creek at Santa Cruz
3. Soquel Creek at Soquel
4. Llagas Creek near Morgan Hill
5. Bodfish Creek near Gilroy
6. Tres Pinos Creek near Tres Pinos
7. San Benito River near Hollister
8. Pajaro River at Chittenden
9. Corralitos Creek near Corralitos
10. Corralitos Creek at Freedom
11. Salinas River near Pozo
12. Salinas River above Pilitas Creek near Santa Margarita
13. Jack Creek near Templeton
14. Salinas River at Paso Robles
15. Estrella River near Estrella
16. Nacimiento River near Bryson
17. San Antonio River at Pleyto
18. Salinas River near Bradley
19. Arroyo Seco near Soledad
20. Salinas River near Spreckels
21. Big Sur River near Big Sur
22. Arroyo De La Cruz near San Simeon
23. Santa Rosa Creek near Cambria
24. Arroyo Grande at Arroyo Grande
25. Sisquoc River near Garrey
26. Santa Maria River at Guadalupe
27. Santa Ynez River below Gibraltar Dam near Santa Barbara
28. Santa Cruz Creek near Santa Ynez
29. San Jose Creek near Goleta

30. Atascadero Creek near Goleta
31. Carpinteria Creek near Carpinteria

1. Boulder Creek Locatelli Ranch
2. Mount Madonna
3. Hollister 10 ENE
4. San Juan Bautista
5. Upper Tres Pinos
6. Del Monte
7. Gonzales 9 ENE
8. Arroyo Seco
9. King City
10. Lockwood 2 N
11. Bryson
12. Paso Robles 5 NW
13. La Panza Ranch
14. San Luis Obispo Cal Poly
15. Cuyama Ranch
16. Santa Maria WB AP
17. Cuyama Ranger Station
18. Point Arguello
19. Cachuma Dam
20. Santa Barbara



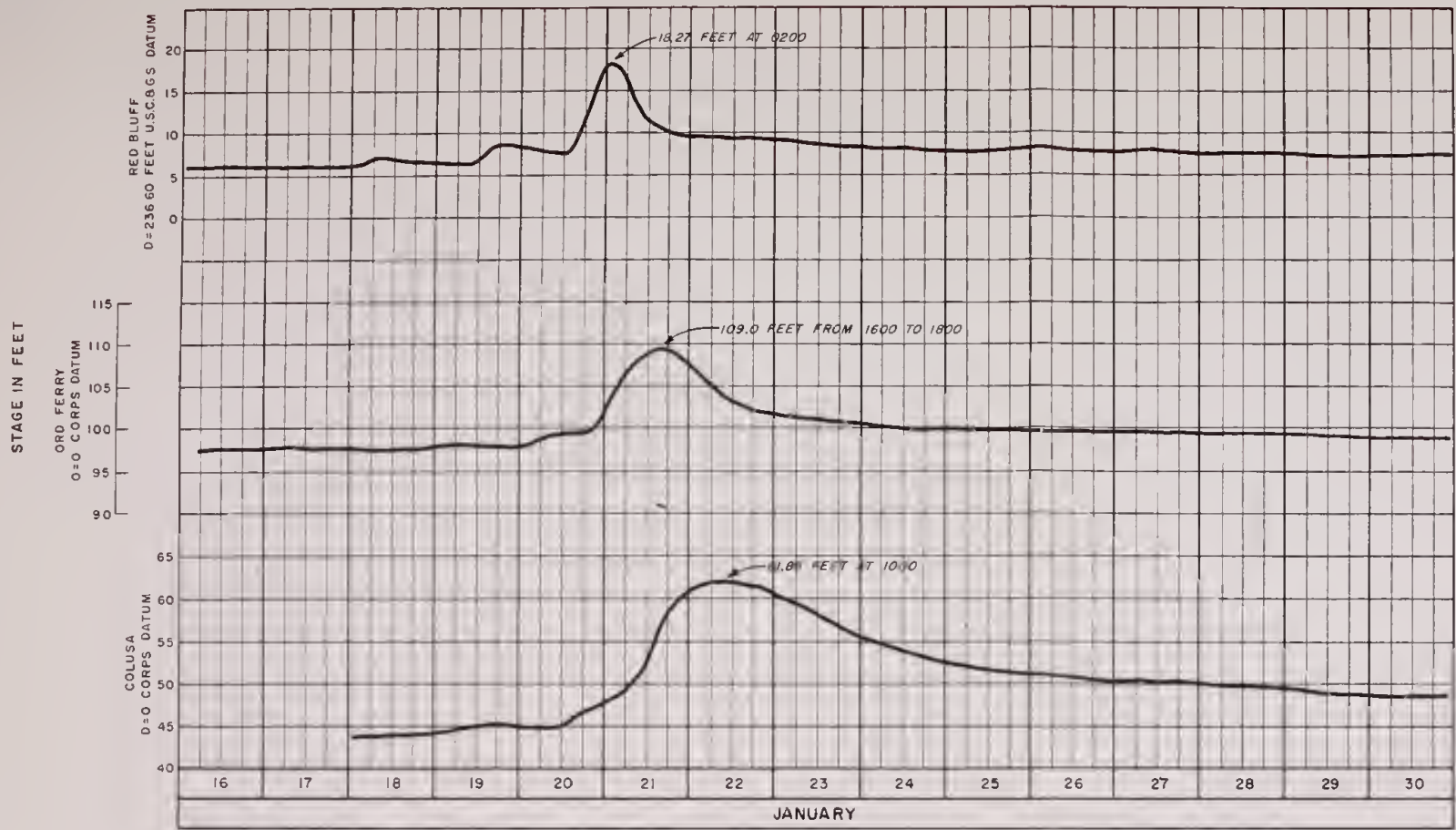
- LEGEND**
- ▲ STREAM GAGING STATION
 - HOURLY PRECIPITATION STATION
 - ◻ RESERVOIR
 - NATURAL LAKE
 - DRAINAGE BASIN BOUNDARY
 - ISOHYETS OF RAINFALL IN INCHES FOR THE PERIOD JAN. 15-25, 1964

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HIGH WATER OF 1963-64
JANUARY 1964 STORM

CENTRAL COASTAL AREA
ISOHYETAL AND STATION LOCATION MAP

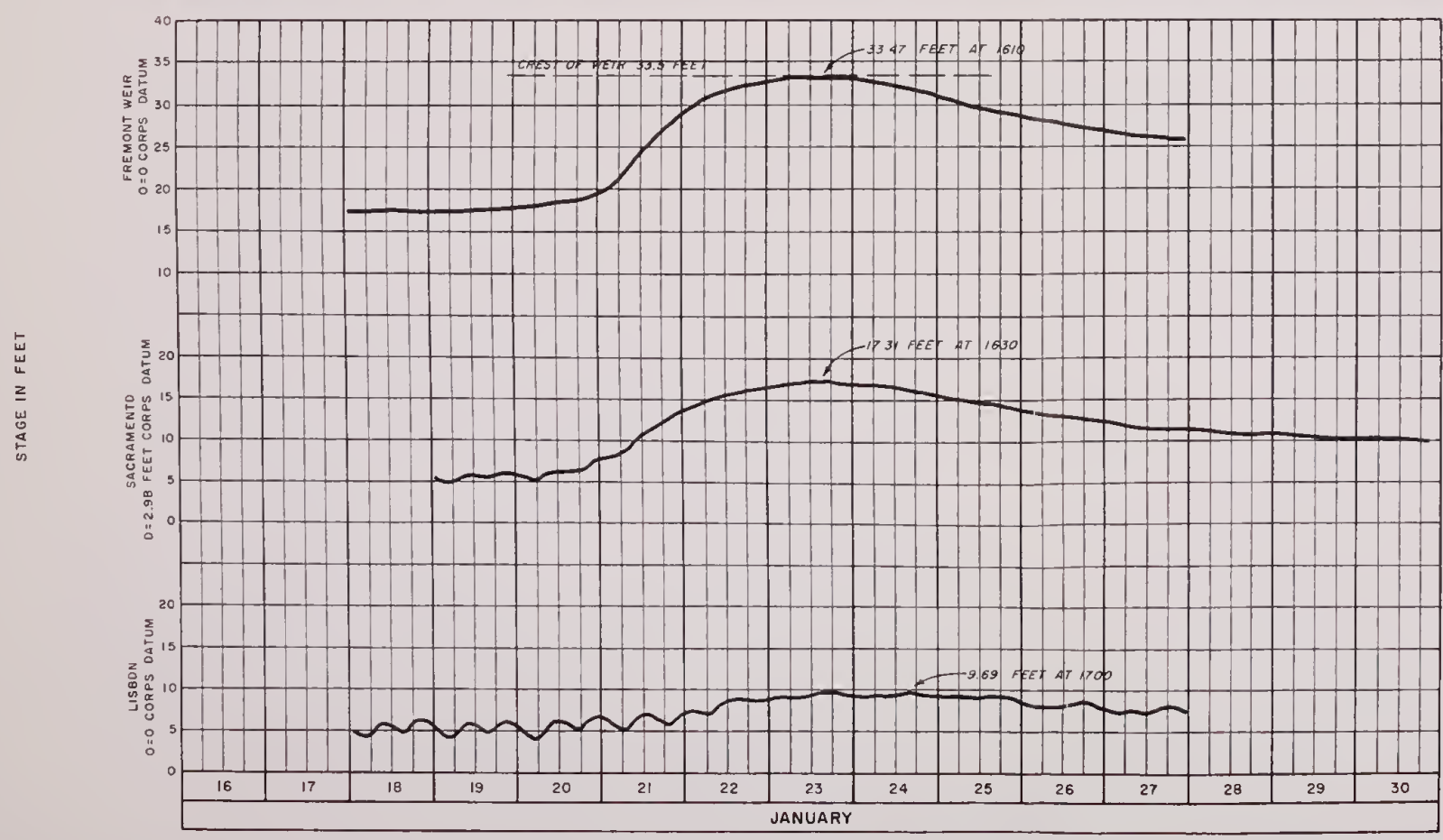




SACRAMENTO RIVER AT RED BLUFF

SACRAMENTO RIVER AT ORD FERRY

SACRAMENTO RIVER AT COLUSA



SACRAMENTO RIVER AT FREMONT WEIR
(WEST END)

SACRAMENTO RIVER AT SACRAMENTO

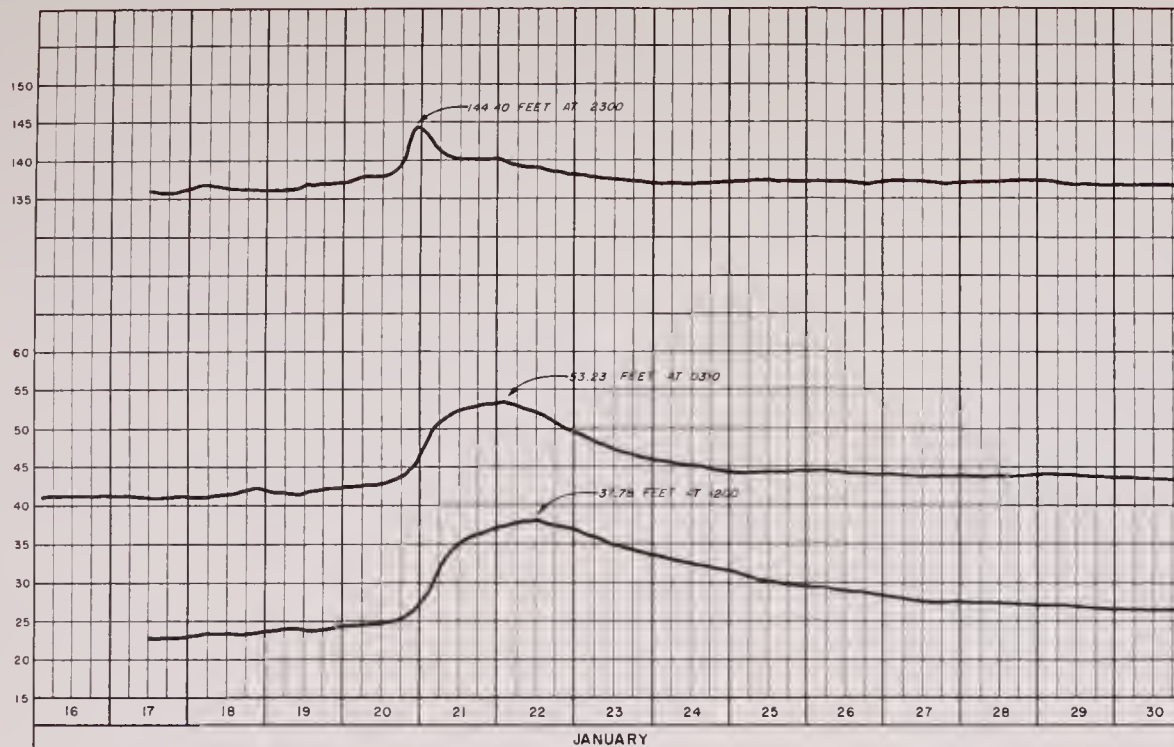
YOLO BYPASS NEAR LISBON

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HIGH WATER OF 1963-64
JANUARY 1964 STORM

GAGE HEIGHTS OF
SACRAMENTO RIVER
AND YOLO BYPASS

STAGE IN FEET

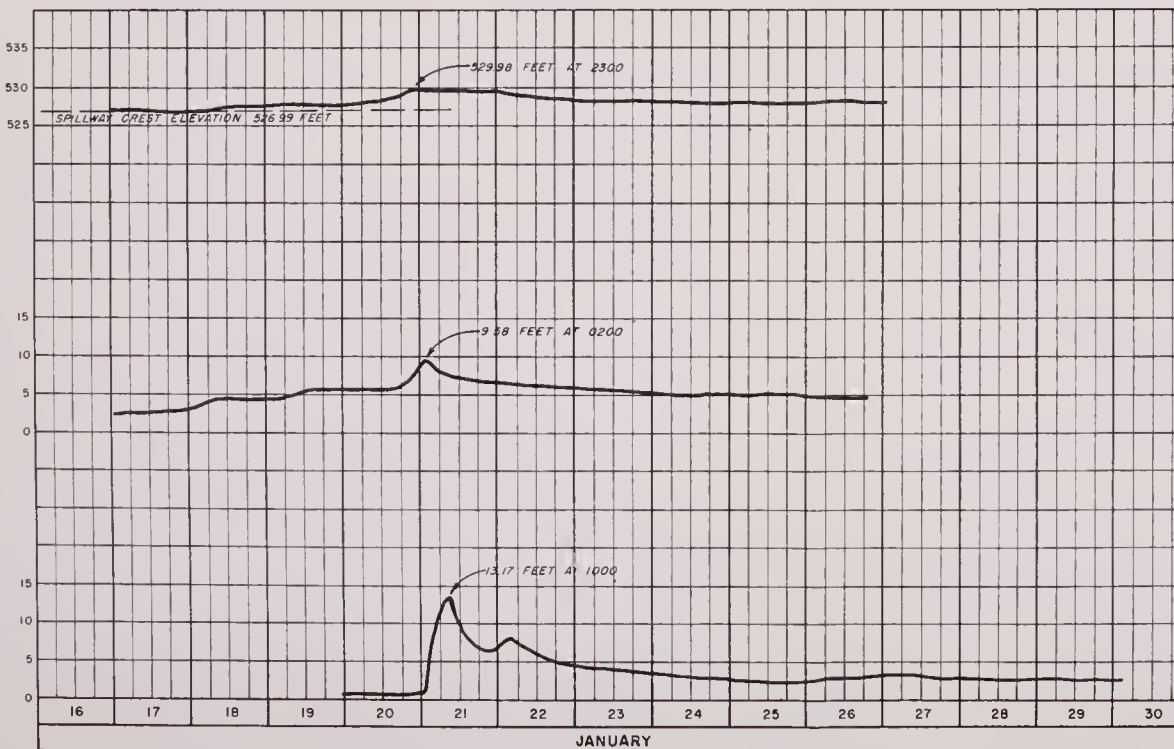
 OROVILLE
 0+0 U.S.C.B.G.S. DATUM


FEATHER RIVER AT OROVILLE

FEATHER RIVER AT YUBA CITY

FEATHER RIVER AT NICOLAUS

STAGE IN FEET

 ENGLEBRIGHT DAM
 0+0 U.S.C.B.G.S. DATUM


YUBA RIVER AT ENGLEBRIGHT DAM

BEAR RIVER NEAR AUBURN

CACHE CREEK AT YOLO

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 HIGH WATER OF 1963-64
 JANUARY 1964 STORM

 GAGE HEIGHTS OF
 FEATHER RIVER, YUBA RIVER
 BEAR RIVER, AND CACHE CREEK

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